

## TORSO EXERCISE METHODS AND APPARATUS

### Cross-Reference to Related Application

This is a continuation-in-part of U.S. Patent Application Serial No. 10/718,763, filed on November 21, 2003.

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### Field of the Invention

The present invention relates to exercise equipment, and in particular, to torso exercise methods and apparatus.

### 10 Background of the Invention

Various exercise devices have been developed to exercise various muscles of the human body, including a person's torso muscles. Many prior art devices primarily work only a person's upper abdominal muscles or a person's lower abdominal muscles. Other prior art devices effectively work both, and some such devices work a person's oblique muscles, as well. Generally speaking, the combination devices are either relatively complicated or relatively ineffective. In another words, a need remains for a relatively simple, yet thoroughly effective torso exercise device.

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### Summary of the Invention

The present invention provides exercise apparatus and methods suitable for exercise of a person's torso muscles. A preferred embodiment of the present invention includes a seat mounted on a frame, an upper body support movably connected to the frame, and a lower body support movably connected to the frame and constrained to move upward in response to downward movement of the upper body

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support. Many of the features and advantages of the present invention will become apparent to those skilled in the art from the more detailed description that follows.

5     Brief Description of the Figures of the Drawing

With reference to the Figures of the Drawing, wherein like numerals designate like parts and assemblies throughout the several views,

10     Figure 1 is a perspective view of a preferred embodiment exercise device constructed according to the principles of the present invention;

Figure 2 is another, generally opposite perspective view of the exercise device of Figure 1;

Figure 3 is a front view of the exercise device of Figure 1;

15     Figure 4 is a back view of the exercise device of Figure 1;

Figure 5 is a side view of the exercise device of Figure 1;

Figure 6 is an opposite side view of the exercise device of Figure 1;

Figure 7 is a top view of the exercise device of Figure 1;

20     Figure 8 is a bottom view of the exercise device of Figure 1;

Figure 9 is a diagrammatic side view of the exercise device of Figure 1, showing the device in a rest position;

Figure 10 is a diagrammatic side view of the exercise device of Figure 1, showing the device in an active position;

25     Figure 11 is a side view of a second exercise device constructed according to the principles of the present invention;

Figure 12 is a side view of the exercise device of Figure 11, showing the device at a different resistance setting;

Figure 13 is a side view of a third exercise device constructed according to the principles of the present invention;

5        Figure 14 is a side view of the exercise device of Figure 13, showing the device at a different resistance setting;

Figure 15 is a side view of a fourth exercise device constructed according to the principles of the present invention;

10       Figure 16 is a side view of the exercise device of Figure 15, showing the device at a different resistance setting;

Figure 17 is a side view of a fifth exercise device constructed according to the principles of the present invention;

Figure 18 is a side view of the exercise device of Figure 17, showing the device in an active position;

15       Figure 19 is a side view of a sixth exercise device constructed according to the principles of the present invention;

Figure 20 is a side view of the exercise device of Figure 19, showing the device in an active position;

20       Figure 21 is a side view of an seventh exercise device constructed according to the principles of the present invention;

Figure 22 is a side view of the exercise device of Figure 21, showing the device in an active position;

Figure 23 is a side view of a eighth exercise device constructed according to the principles of the present invention;

25       Figure 24 is a side view of the exercise device of Figure 23, showing the device in an active position;

Figure 25 is a side view of a ninth exercise device constructed according to the principles of the present invention;

Figure 26 is a side view of the exercise device of Figure 25, showing the device in an active position;

5        Figure 27 is a side view of a tenth exercise device constructed according to the principles of the present invention;

Figure 28 is a side view of the exercise device of Figure 27, showing the device in an active position;

10       Figure 29 is a side view of a eleventh exercise device constructed according to the principles of the present invention;

Figure 30 is a side view of the exercise device of Figure 29, showing the device in an active position;

15       Figure 31 is a side view of a twelfth exercise device constructed according to the principles of the present invention; and

Figure 32 is a side view of the exercise device of Figure 31, showing the device in an active position.

#### Detailed Description of a Preferred Embodiment

20       A first exercise device constructed according to the principles of the present invention is designated as 100 in Figures 1-8. The device 100 may be described generally in terms of a frame, an upper body support movably mounted on the frame, a lower body support movably mounted on the frame, and a means for biasing  
25       the upper body support toward an upper end of the frame, and for biasing the lower body support toward the lower end of the frame.

The frame may take various shapes and/or be made in various manners. On the device 100, the frame 110 includes a floor engaging base that is I-shaped and extends from a forward end 111 to a rearward end 112. An intermediate stanchion 115 is rigidly  
5 connected to an intermediate portion of the base, and extends upward and rearward from the base. The stanchion 115 comprises four bars that define gaps therebetween.

The seat 120 is rigidly mounted on top of the stanchion 115. The seat 120 preferably includes a covered padded portion and an  
10 underlying support structure. A trunnion 124 is mounted beneath the forward end of the seat 120 for reasons discussed below. On the device 100, an upwardly extending back support is provided along the rear edge of the seat 120. Among other things, the seat 120 may be described as sized and configured to support a person in  
15 a seated position above an underlying floor surface. Figure 7 shows a top view of the apparatus 100, and illustrates to what extent other components are disposed beneath the planform of the seat 120.

A curved bar 140 has an intermediate portion that is pivotally  
20 connected to the trunnion 124, thereby defining a pivot axis X (labeled in Figure 5) that extends beneath the planform defined by the seat 120. The bar 140 is configured and arranged in such a manner that a forward end of the bar 140 is disposed in front of the seat 120. A universal joint bracket 139 is mounted on the  
25 forward end of the bar 140, thereby defining a lower pivot axis that extends "fore-to-aft" and an upper pivot axis that extends

"side-to-side". The bracket 139 pivots side-to-side about the lower axis relative to the bar 140. As shown in Figure 1, tabs 143 project outward from opposite sides of the bracket 139 to limit pivoting of the bracket 139 relative to the bar 140.

5 A tube 135 has a lower end pivotally connected to the bracket 139 at the upper pivot axis. As a result, the tube 135 pivots fore-and-aft relative to the bracket 139, and side-to-side together with the bracket 139. As shown in Figure 5, pegs 138 project outward from opposite sides of the tube 135 and cooperate with the  
10 bracket 139 to limit pivoting of the tube 135 relative to the bracket 139. A sleeve or bellows (not shown) is preferably disposed about the universal joint both for aesthetic purposes and to cover potential pinch points.

A bar 131 has a lower end that slides or telescopes inside the  
15 tube 135. As suggested by Figures 1 and 3, the bar 131 is also preferable keyed to the tube 135 to prevent relative rotation therebetween. In this regard, a nub on the tube 135 projects into a groove extending along the bar 131. As a result of the key arrangement, a hole in the bar 131 aligns with any one of a series  
20 of holes 136 in the tube 135 to receive a ball-detent pin 137 or other suitable fastener. A cross-bar 132 has an intermediate portion that is rigidly mounted on the upper end of the bar 131. Opposite ends 133 of the cross-bar 132 are angled downward and forward, and may be described as hand grips that are sized and  
25 configured for grasping. The members 131, 132, and 140 may be collectively described as a handlebar or an upper body support 130.

The upper body support 130 is configured and arranged to place the hand grips 133 within comfortable reach of an average adult person sitting on the seat 120, and to place the center of the cross-bar 132 proximate the person's chest. A chest pad may be mounted on the intermediate portion of the cross-bar 132 to provide a comfortable bearing member for the person's chest. Moreover, in order to accommodate people with different heights and/or reaches, the fastener 137 and associated holes allow the cross-bar 132 and hand grips 133 to be adjusted upward and downward, and the upper pivot axis on the universal joint bracket 139 allows the cross-bar 132 and associated hand grips 133 to be pivoted fore and aft.

An intermediate portion of the bar 140, disposed rearward of the trunnion 124, is pivotally connected to the upper end of a link 170. An opposite, lower end of the link 170 is pivotally connected to an intermediate portion of a tube 161. A rearward end of the tube 161 is pivotally connected to the stanchion 115, thereby defining a pivot axis Y (labeled in Figure 5) that extends beneath the planform defined by the seat 120. The bar 140 is arranged to intersect or cross over a line L (shown in Figure 5) drawn perpendicularly through both the pivot axis Y and the pivot axis X.

A bar 162 has a rearward end that is mounted inside a forward end of the tube 161. In a manner similar to the bar 131, the bar 162 may be telescopically mounted inside the tube 161, keyed relative to the tube 161, and adjusted relative to the tube 161 by means of a ball-detent pin 163 inserted through a hole in the tube 161 any one of a series of holes in the bar 162. In the

alternative, the bar 162 may simply be bolted to the tube 161 or connected via a hinge.

A foot supporting assembly is mounted on a forward end of the bar 162. The assembly may be described as a "sideways" H, with the center of the H rigidly connected to the bar 162. Left and right lower foot members 164 extend in respective directions away from the center of the H. The members 164 are sized and configured to support a person's feet, and are preferably padded by foam tubes or other suitable means. Left and right upper foot members 166 extend in respective directions away from the center of the H. The members 166 are similarly padded, and are sized and configured to overlies a person's feet. The members 164 and 166 cooperate with the bar 162 and the tube 161 to define a lower body support 160 that can receive both pushing and pulling forces exerted through a person's feet. In a first mode of operation, a person sits on the seat 120 with his legs straddling the upper body support 130, and places his feet on respective sides of the lower body support 160.

The link 170 constrains the lower body support 160 and the upper body support 130 to pivot in opposite directions relative to the frame 110. For example, downward movement of the upper body support 130 causes upward movement of the lower body support 160, and upward movement of the lower body support causes downward movement of the upper body support 130. In the absence of a dedicated resistance device, these movements may be performed on the apparatus 100 subject to the force of gravity acting on the mass of the user's legs.



The device 100 is also provided with structure to accommodate additional resistance or biasing means in the form of at least one elastic band 180. This type of resistance band 180 is well known in the art and used on other types of known exercise equipment.

5 The resistance band 180 is releasably mounted on the apparatus 100 by means of pegs 118 and 148. In this regard, left and right pegs 118 are rigidly secured to the frame 110, and project outward from respective sides of the stanchion 115 just above the floor engaging base. Also, left and right pegs 148 are rigidly secured to a rearward end of the bar 140, and project outward from respective sides of the bar 140. The bar 140 projects rearward through a gap in the stanchion 115 to meet the pegs 148, which project laterally through opposite side gaps in the stanchion 115.

15 Each peg 118 and 148 is configured to fit into a hole in a respective end of the elastic band(s) 180. Means may be provided on the pegs 118 and 148 and/or the band(s) 180 to help secure the band(s) in place on the pegs. Furthermore, the pegs 118 and 148 may be spaced in such a manner that the band(s) 180 are always in tension when mounted on the pegs. Each band 180 mounted on the pegs 118 and 148 will resist downward movement of the upper body support 130 and thus, upward movement of the lower body support 160, as well.

25 The present invention facilitates exercise of a person's upper abdominal muscles (by user force exerted downward against the hand grips 133 and/or a pad on the cross-bar 132), and exercise of a person's lower abdominal muscles (by user force exerted upward

against the foot members 166). The present invention also encourages contemporaneous exercise of all of the abdominal muscles by coordinating movement of the upper and lower force receiving members 130 and 160. As shown in Figures 9-10, wherein the above-  
5 described device is shown diagrammatically and designated as 100', the upper body support 160 is constrained to move upward in response to downward movement of the upper body support 130. As suggested by Figures 9-10, the device 100' may be built and/or operated without any resistance above and beyond the weight of a  
10 person's legs resting on the lower body support 160.

The present invention also facilitates exercise of a person's oblique muscles (by movement of the force receiving members 130 and 160 while the user occupies a "twisted" position on the apparatus 100). In alternative modes of operation, exercise of the oblique  
15 muscles may be achieved by turning to either side on the seat 120, lifting upward with one's feet while both feet are positioned on one side of the lower body member 160, and/or pushing downward on the upper body member 130 while displacing it laterally, as well.

There are other ways to implement the present invention using  
20 a conventional elastic band to provide resistance. For example, Figures 11-12 show a device 100" that is similar to the device 100, except for the resistance arrangement. In this regard, a conventional elastic band 180 has a lower end that is secured to the frame 110", and an upper end that is movably connected to the  
25 bar 140". More specifically, the upper end of the band 180 is connected to the rearward end of a link 194 which in turn, is

slidably mounted in an arcuate slot 184 defined by the bar 140". The slot 184 is centered about the connection point between the band 180 and the frame 110".

5 An opposite, forward end of the link 194 is pivotally connected to the lower end of a lever 196. An intermediate portion of the lever 196 is pivotally mounted on the bar 140", and an upper end 197 of the lever 196 is configured for user manipulation into and out engagement with a series of notches in a bracket 198 that is mounted on top of the bar 140". The notches are arranged in an  
10 arc about the pivot axis defined by the lever 196.

When the device 100" is configured as shown in Figure 11 (with the band 180 relative forward in the slot 184), the band 180 is stretched a first amount in response to a given amount of downward pivoting of the upper body support 130. When the device 100" is  
15 configured as shown in Figure 12 (with the band 180 relative rearward in the slot 184), the band 180 is stretched a greater, second amount in response to the same given amount of downward pivoting of the upper body support 130. In other words, Figure 11 shows the maximum resistance setting, and Figure 12 shows the  
20 minimum resistance setting. The arcuate slot 184 is configured and arranged so the user can adjust the resistance without exerting force on the band 180.

Figures 13-14 show another device 200 that is similar to the device 100 except for the resistance arrangement. In this regard,  
25 a conventional elastic band 280 has a rearward end secured to the frame 210, and a forward end secured to the rear end of a cable

282. The cable 282 is routed about a pulley 284 on the frame 210, and an opposite, forward end of the cable 282 is configured to receive and/or retain a fastener 286. A bracket 288 is rigidly mounted on the lower leg support 160', and the fastener 286 is inserted through one of several holes 289 in the bracket 288.

When the device 200 is configured as shown in Figure 13 (with the fastener 286 in the rearwardmost hole 289), the band 280 is stretched a first amount in response to a given amount of upward pivoting of the lower body support 160'. When the device 200 is configured as shown in Figure 14 (with the fastener 286 in the forwardmost hole 289), the band 280 is stretched a lesser, second amount in response to the same given amount of upward pivoting of the lower body support 160'. In other words, Figure 13 shows the maximum resistance setting, and Figure 14 shows the minimum resistance setting. Because the holes 289 are arranged in an arc centered about the pulley 284, the user is able to adjust the resistance without exerting force on the band 280.

Those skilled in the art will recognize that different types of resistance devices (e.g. springs, elastic cords, hydraulic cylinders, gas springs, weights, and the like) may be substituted for conventional elastic bands without departing from the scope of the present invention. For example, Figures 15-16 show a device 200' that is similar to the device 200, except that a bungee cord 290 has been substituted for the elastic band 280 and cable 282. The bungee cord 290 has a rearward end secured to the frame 210, and a forward end configured to receive and/or retain a fastener

286. An intermediate portion of the bungee cord 290 is routed about a pulley 284 on the frame 210. A bracket 288 is rigidly mounted on the lower leg support 160', and the fastener 286 is inserted through one of several holes 289 in the bracket 288.

5           When the device 200' is configured as shown in Figure 15 (with the fastener 286 in the rearwardmost hole 289), the bungee cord 290 is stretched a first amount in response to a given amount of upward pivoting of the lower body support 160'. When the device 200' is configured as shown in Figure 16 (with the fastener 286 in the  
10 forwardmost hole 289), the bungee cord 290 is stretched a lesser, second amount in response to the same given amount of upward pivoting of the lower body support 160'. In other words, Figure 15 shows the maximum resistance setting, and Figure 16 shows the minimum resistance setting. Because the holes 289 are arranged in  
15 an arc centered about the pulley 284, the user is able to adjust the resistance without exerting force on the bungee cord 290.

Figure 17-18 show an alternative embodiment exercise device 300 that is similar to the foregoing embodiments except that a leaf spring 380 is used to provide resistance to the abdominal exercise  
20 motion (and an upper body support 330 is provided with a different means for adjusting the height of the handles 333 relative to the seat 120). The leaf spring 380 has a rearward end that is slidably connected to a bracket 318 mounted on a rearward portion of the frame 310, and a forward end that is connected to a bracket 385  
25 which in turn, is slidably mounted on the lower body support 360. A fastener 386 is inserted through the bracket 385 and into one of

several holes 369 in the lower body support 360 to set the level of resistance.

When the fastener 386 is relatively rearward on the lower body support 360, the leaf spring 380 is subjected to force exerted at  
5 a first distance from the pivot axis of the lower body support 360. When the fastener 386 is relatively forward on the lower body support 360, the leaf spring 380 is subjected to force exerted at a second, relatively greater distance from the pivot axis of the lower body support 360. In other words, the level of resistance  
10 increases as the leaf spring 360 is moved rearward relative to the frame 310. Because the leaf spring 380 slides at both ends during adjustment, the user is able to adjust the resistance without exerting force on the leaf spring 380.

Figures 19-20 show another device 400 that is similar to the  
15 device 100 except for the resistance arrangement (and an accompanying change in location of the pivot axis for the lower body support 460). In this regard, a conventional elastic band 480 has a rearward end secured to the frame 410, and a forward end secured to the rear end of a cable 482. An opposite, forward end  
20 of the cable 482 is configured to engage a bracket 488 that is rigidly connected to the lower leg support 460 (and pivotally connected to the frame 410). More specifically, a member 485 on the forward end of the cable 482 is slidably mounted in an arcuate slot 487 in the bracket 488, and the member 485 is also configured  
25 to receive and/or retain a fastener 486 that is inserted through one of several holes 489 in the bracket 488.

When the member 485 is relatively low on the bracket 488 (as shown in Figures 19-20), the band 480 is stretched a first amount in response to a given amount of upward pivoting of the lower body support 460. When the member 485 is relatively high on the bracket 488 (not shown), the band 480 is stretched a lesser, second amount in response to the same given amount of upward pivoting of the lower body support 460. In other words, the level of resistance increases as the member 485 is moved downward along the bracket 488. Because the holes 489 and the arcuate slot 487 are centered about the connection point between the band 480 and the frame 410, the user is able to adjust the resistance without exerting force on the band 480.

Figures 21-22 show an alternative embodiment 500 that is similar to the previous embodiments except for the manner in which the upper body support 530 is supported. As on previous embodiments, a bar 540 is pivotally interconnected between a lower end of the upper body support 530 and an upper end of a link 570, and an intermediate portion of the bar 540 is pivotally connected to a trunnion 524 mounted beneath the seat 120. In addition, a second bar 541 is pivotally interconnected between the upper body support 530 and the trunnion 524. As a result of this arrangement, the upper body support 530 is constrained to remain in a fixed orientation relative to the frame 110.

Figures 23-24 show an alternative embodiment 600 having an upper body support 630 that is linked to a lower body support 660 in an alternative manner. More specifically, the upper body

support 630 has an upper end that is configured to support a person's hands and/or chest (like those on other embodiments), and an intermediate portion that is slidably connected to the frame 610 at sleeve 623. In order to accommodate changes in orientation of the upper body support 630 relative to the frame 610, there is preferably a loose fit between the body support 630 and the sleeve 623, and/or a pivotal connection between the sleeve 623 and the frame 610. A lower end of the upper body support 630 is pivotally connected to a rearward end of the lower body support 660. An opposite, forward end of the lower body support 660 is configured to support a person's feet (like those on other embodiments), and an intermediate portion of the lower body support 660 is pivotally connected to the frame 610. As suggested by Figures 23-24, downward movement of the upper body support 630 causes upward movement of the lower body support 660.

The present invention may also be implemented in a manner that uses a person's body weight to provide resistance to exercise (alone or in combination with other forms of resistance described above). For example, Figures 25-26 show an exercise device 700 like the device 100, but modified to raise the seat 720 in response to downward movement of the upper body support 130. The upper body support 130 is connected to the lower body support 160 in the same manner as on the first device 100. However, a rearward end of the seat 720 is pivotally connected to a trunnion 717 on the frame 710, and an opposite, forward end of the seat 720 overlies a bearing member 742 on a rearward portion of the link 740. The bearing



member 742 is configured and arranged to rest just beneath the seat 720 when the body supports 130 and 160 occupy respective rest positions (as shown in Figure 25), and to push upward on the seat 720 in response to downward movement of the upper body support 130 (as shown in Figure 26).

Figures 27-28 show an exercise device 800 that combines the features of the device 700 (shown in Figures 25-26) and the device 400 (shown in Figures 19-20). In other words, the device 800 operates in the same manner as the device 700 but with additional resistance of the type provided on the device 400. As on the device 700, the upper body support 130 is connected to the lower body support 160; a rearward end of the seat 820 is pivotally connected to a trunnion 717 on the frame 810; and an opposite, forward end of the seat 820 overlies a bearing member 842 on a rearward portion of the link 840. The bearing member 842 (which may be a bar or a roller on this embodiment 800) is configured and arranged to rest just beneath the seat 820 when the body supports 130 and 160 occupy respective rest positions (as shown in Figure 27), and to push upward on the seat 820 in response to downward movement of the upper body support 130 (as shown in Figure 28).

Upward movement of the seat 820 is resisted by an elastic band arrangement (in addition to the weight of the seat 820 and anyone sitting on it). In this regard, an elastic band 880 has a lower end secured to the frame 810, and an opposite, upper end secured to the lower end of a cable 882. An opposite, upper end of the cable 882 is configured to engage the seat 820. More specifically, a

member 885 on the upper end of the cable 882 is slidably mounted in an arcuate slot 887 in the seat 820, and the member 885 is also configured to receive and/or retain a fastener 886 that is inserted through one of several holes 889 in the seat 820.

5           When the member 885 is relatively rearward in the slot 887, the band 880 is stretched a first amount in response to a given amount of upward pivoting of the seat 820. When the member 885 is relatively forward in the slot 887, the band 880 is stretched a greater, second amount in response to the same given amount of  
10           upward pivoting of the seat 820. In other words, the level of resistance increases as the member 885 is moved forward along the slot 887. Because the holes 889 and the arcuate slot 887 are centered about the connection point between the band 880 and the frame 810, the user is able to adjust the resistance without  
15           exerting force on the band 880.

          Figures 29-30 show another device 900 that uses a person's body weight to resist downward movement of the upper body support 130. The device 900 includes a seat support 919 having a lower end that is pivotally connected to a rearward end of the frame 910.  
20           The seat 920 is rigidly mounted on an opposite, upper end of the seat support 919. A trunnion 924 extends downward from a forward portion of the seat 920 to support an intermediate portion of the link 140, and the link 170 is interconnected between the link 140 and the lower body support 960. Unlike the embodiments described  
25           above, another link 990 is pivotally interconnected between the lower body support 960 and the seat support 919. More

specifically, a bracket 966 is provided on the lower body support 960, and a fastener 986 is inserted through a hole in the link 990 and one of several holes 968 in the bracket 966.

When the link 990 is secured to an end of the bracket 966 proximate the pivot axis of the lower body support 960, the seat 920 pivots a first amount in response to a given amount of upward movement of the lower body support 960. When the link 990 is secured to an opposite end of the bracket 966, the seat 920 pivots a greater, second amount in response to the same amount of upward movement of the lower body support 960. In other words, the level of resistance increases as the fastener 986 is moved away from the pivot axis of the lower body support 960. The holes 968 in the bracket 966 are arranged in an arc centered about the pivot axis defined between the link 990 and the seat support 919, so the fastener 986 adjustment may be made without moving the seat 920 from its rest position.

Figures 31-32 show a device 1000 that is similar to the device 900, but with a different seat supporting arrangement. More specifically, the seat 920 is mounted on top of a seat support 1029, and first and second parallel links 1021 and 1022 are pivotally interconnected between the seat support 1029 and a frame member 1002. The links 1021 and 1022 constrain the seat 920 to remain in a fixed orientation relative to the frame 1010. Figure 31 shows the device 1000 in a rest position, and Figure 32 shows the device 1000 in an active position.

Figures 33-34 show another device 1100 that is similar to the device 900, but with another unique seat supporting arrangement. On this embodiment 1100, the frame 1110 includes a post 1102 that extends upward from a middle portion of the floor engaging base. A seat support 1129 is slidably mounted on the post 1102, and the seat 920 is rigidly mounted on top of the seat support 1129. The additional link 990 is pivotally interconnected between the seat support 1129 and the lower body support 960, thereby constraining the seat support 1129 to move upward in response to upward movement of the lower body support 960.

The present invention may also be described in terms of various methods with reference to the foregoing embodiments. One such method comprises the steps of providing an exercise apparatus having a frame; a seat mounted on the frame; a handlebar movably mounted on a first portion of the frame and extending generally vertically upward in front of the seat; a foot support movably mounted on a second portion of the frame and extending generally horizontally outward beneath the handlebar and forward of the seat, wherein the foot support has a forward end sized and configured to support a user's feet, a first rearward portion pivotally connected to the frame, and a second rearward portion linked to the handlebar in a manner that links downward movement of the handlebar to upward movement of the foot support. A user sits upright on the seat, places his hands on the handlebar, and places his feet on the foot support. The user then lifts his feet by lifting upward on the foot support, and/or pushing downward on the handlebar.

The present invention has been described with reference to particular embodiments and specific applications, and various features of different embodiments may be mixed and matched in numerous ways to arrive at additional embodiments. Moreover, this disclosure will also enable persons skilled in the art to recognize additional embodiments and/or applications that incorporate the essence of the present invention. Among other things, various parts of the present invention may be provided in different shapes or arrangements to change the appearance of the apparatus and/or the relative movements of the parts. Also, any of various shrouds may be mounted beneath the seat and about the stanchion and proximate parts to improve the appearance of the apparatus and/or cover potential pinch points. Any such shroud may be provided with an opening or a remote operator to facilitate adjustment of the resistance device (if any) on the apparatus. With the foregoing in mind, the scope of the present invention is to be limited only to the extent of the following claims.